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Robert~
Decl.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| APPLICANTS : | David Godfrey Williams | | |
| SERIAL NUMBER : | 09/586,824 | EXAMINER: | R. Yan |
| FILING DATE : | June 5, 2000 | ART UNIT: | 2854 |
| FOR : | New Title: IMPROVED STENCIL | | |
| | (was: APPARATUS FOR SUPPORTING AND TENSIONING A STENCIL) | | |



Boston, Massachusetts

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

# DECLARATION OF VALENTIJN VAN VELTHOVEN UNDER 37 C.F.R 1.132

Sir:

I, Valentijn Van Velthoven of 84 Orchard Lane, Berkeley Heights, New Jersey, declare and state that:

1. I have been employed as Global Stencil Business Development Manager by Cookson Electronics Assembly Materials since November 2002. A principal aspect of my role as business development manager has been studying and understanding the different types of stencils in the PCB-fabrication market and the market share of each type. Previously, I was European Marketing Manager for Assembly Materials from April 2001 through October 2002. From April 2000 through February 2001, I was General Manager for the Belgian Stencil Operation, which is one of Cookson Electronics Assembly Materials' largest stencil operations. I started my career with Cookson Electronics as a sales manager of stencil print equipment with Speedline Technologies, Inc. d/b/a MPM (another Cookson Electronics company).

2. I graduated from Nederlands Institut voor Marketing (NIMA) with a bachelor degree in marketing.

3. I have reviewed U.S. Patent Application Serial No. 09/586,824 and its updated claims, as amended in the Amendment to be filed concurrently herewith, and I understand the contents of each. I have likewise reviewed published British Patent Application No. 2,264,460 A, and I understand its contents.

4. I am familiar with a stencil that matches the drawings and description provided in GB 2,264,460; I am also familiar with the development of this stencil and its market performance. This stencil was commercially marketed as the "MicroMount" stencil and was manufactured by Micro Metallic, Ltd. in England. The MicroMount stencil includes apertures for engagement with mounting teeth on a tensioning frame along two edges of the stencil.

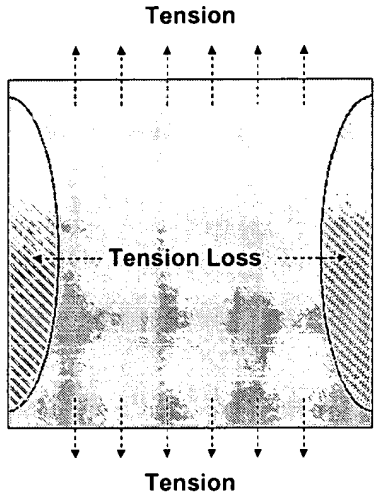
5. I am familiar with a stencil that fits the description of the claims of USSN 09/586,824, as amended in the accompanying amendment. I am also familiar with the development of this stencil and its market performance. This stencil was commercially marketed as the "TETRA stencil" and was likewise manufactured by Micro Metallic on behalf of Cookson Electronics Assembly Materials. The TETRA stencil includes apertures for engagement with mounting teeth on a tensioning frame along all four edges of the stencil. The TETRA stencil was originally known as the "Vector Mount" stencil, though the name, "TETRA stencil," is used to refer to this stencil throughout this Declaration for purposes of clarity and ease of reference.

6. Unlike elastic stencils, such as those described in U.S. Patent 2,073,379 (issued to Rasmussen), both the MicroMount and TETRA stencils are made of metal and are substantially inelastic.

7. The MicroMount stencil, as described in GB 2,264,460, was first introduced to the market approximately in 1989. The MicroMount stencil was developed in conjunction with the tensioning frame described in GB 2,264,460 for engagement along two edges of the stencil. Unlike earlier stencils designed for the printed circuit board industry, the MicroMount stencil consisted solely of an apertured metal foil and was termed, a "frameless" stencil, because it did not include the traditional structure of a rigid frame and

an elastic mesh glued to the apertured body (hereafter, referred to as a "mesh-and-frame stencil"). We believe that the MicroMount stencil was the first stencil to be designed so as to be replaceably (*i.e.*, not permanently) mounted on mounting teeth for printing solder, adhesives, flux gel, *etc.*, onto a printed circuit board, and it was designed in an effort to provide an alternative to traditional mesh-and-frame stencils that was simpler, more-easily fabricated, not subject to stretching and debonding (of the mesh), and capable of being subject to greater and more-uniform tension. Other companies likewise produced other frameless stencils after the introduction of the MicroMount stencil; however, the combined frameless-stencil market remained much smaller than the market for mesh-and-frame stencils.

8. The MicroMount stencil had the largest market share in the PCB fabrication industry among frameless stencils until the introduction of the TETRA stencil. The MicroMount stencil generally accounted for about 20% of the overall frameless stencil market in the PCB fabrication industry; this market peaked at sales of about 25,000 stencils/year in the PCB fabrication industry in 1997, the year preceding the introduction of the TETRA stencil. In comparison with the sales of frameless stencils in the PCB fabrication industry after the introduction of the TETRA stencil (see paragraph 11, below), these sales figures are very small. Feedback from customers indicated that limitations of these frameless stencils, particularly in difficulties and drawbacks associated with their tensioning, were perceived by many to outweigh their advantages. Typically, bi-directional (two-sided) tensioning of the MicroMount and similar stencils would produce areas subject to reduced tension along the stencil's non-tensioned sides, thereby compromising print accuracy and reducing the useable print area, as is schematically illustrated in the drawing below:




9. The TETRA stencil, described in USSN 09/586,824, was developed as an improvement on the MicroMount stencil after the inventor discovered that the MicroMount stencil could bow slightly inward at the un-tensioned edges (notwithstanding efforts to apply tension uniformly across the two edges) to form a slight hourglass shape in the stencil. This bowing effect could result in displacement of the stencil apertures through which solder is printed and, hence, in misplaced solder deposits on a printed circuit board.

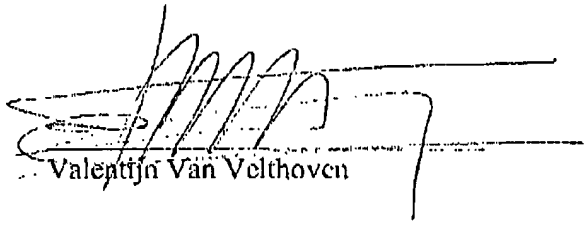
10. All four apertured edges of the TETRA stencil could not be engaged by the tensioning frame described in GB 2,264,460. Consequently, a new tensioning frame (*i.e.*, the "TETRA frame") was developed to enable engagement of a stencil along four edges. Accordingly, the TETRA stencil and tensioning frame, both described in USSN 09/586,824, were jointly developed to enable four-sided stencil engagement and tensioning; and we believe that both the frame and the stencil were novel and that the benefits that were obtainable therewith were previously unrecognized.

11. The TETRA stencil of USSN 09/586,824 was first introduced to the market in 1998. All or nearly all customers quickly switched from the MicroMount stencil of GB 2 264 460 to the TETRA stencil after the latter was introduced, and many times more stencils were sold after the introduction of the TETRA stencil. The sale of TETRA stencils in its first year of production (*i.e.*, about 35,000 stencils) dwarfed the sale of MicroMount stencils in

the preceding year (*i.e.*, about 5,000 stencils) and also finally, after the limited success of two-sided frameless stencils, signaled a substantial industry-wide customer migration from the traditional mesh-and-frame stencils to the new frameless stencils. The sales of TETRA stencils continued to grow thereafter. Moreover, the strongly positive market reaction to the TETRA stencil contributed to the overall market acceptance of "frameless systems," and many other companies began producing similar frameless stencils having apertures along four sides for engagement along each of the four sides. The overall market for frameless stencils skyrocketed from about 25,000 stencils/year to about 500,000 stencils/year in the year following the introduction of the TETRA stencils. Most of the frameless stencils sold after the introduction of the TETRA stencil were stencils with apertures for engagement along four sides, with most stencils produced by competitors likewise adopting a stencil design wherein apertures are provided along four edges of the stencil.

12. There were no significant differences in the MicroMount and TETRA stencils other than the provision of apertures along the other two edges in the TETRA stencil. Though, there were differences in the tensioning frames used for the two different stencils, particularly in the use of a pneumatic system in the TETRA tensioning frame for engaging the apertures in the four sides of the TETRA stencil. Based on favorable customer feedback and a relative absence of other plausible factors, we attribute the commercial success of the TETRA stencil primarily to the provision of apertures along all four of its edges, as described in the claims of USSN 09/586,824, and its consequent capacity for being engaged and tensioned by the TETRA frame along all four edges and the resulting decrease or elimination of the bowing effect that plagued the MicroMount stencil. I do not believe that there were any other significant changes in the market (particularly, in terms of overall customer stencil demand) or in our advertising and marketing (or that of others) that would account for the magnitude of improvement in frameless stencil sales after the introduction of the TETRA stencil.

13. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that willful false statements may jeopardize the validity of this application and any patent issuing therefrom.

Dated: 11/10/03, 2003 by: 
Valentijn Van Velthoven